

ZT11 Pressure Sensor for Semiconductor Industry

Outline

This instrument is a pressure sensor that uses thin film deposition type semiconductor strain gauge. We added the increased safety construction type to our portfolio that improves safety still farther when using equipment and facilities.

Features

- Zero adjustment mechanism is provided on the side of the case to improve workability.
- Pressure sensor : Lineup of UHP grade equivalent to Hastelloy®C-22.
- Added the increased safety construction type to our portfolio.



Product appearance			
	Type	Standard (Gauge pressure)	Increased safety (Gauge pressure)
	Model number	ZT11-2	ZT11-F, H
	Label color	Green	Black



List of grade

Cleanliness These pressure sensor have been assembled, adjusted, inspected and packaged in a clean room, paying special attention for maintaining cleanliness.

Grade		UHP (Ultra-High Purity)	EP (Electro Polishing)	GP (General Purpose)
Surface roughness of gas contact		0.13 μm Ra Avg.	0.18 μm Ra Avg.	0.5 μm Ra Avg.
Wetted parts	Pressure sensor	Hastelloy®C-22 equivalent	SUS316L	
	Fitting	SUS316L		
Maximum allowable pressure *1		200% of rated pressure	150% of rated pressure	
Leakage (Helium leak rate)		5 × 10 ⁻¹² Pa · m ³ /s or under		
Particle		Zero count for size 0.1 μm or greater (In our inspection standard)		No regulation
Cleaning		Ultra clearance (Cleaning)		Degreasing
Operating media *2 (Recommended)		High-purity gas, semiconductor material gas, etc.		Purge gas, exhaust gas, etc.

*1 The maximum allowable pressure is the upper limit of pressure value which may safely be applied to the product and remain in specification once pressure is returned to the rated range which a couple of times over pressurization for about 10 minutes. Effects of continuous over pressure are not guaranteed.

*2 Please confirm if the gas contact part material is suitable for the gas to be measured.

* UHP grade is double packed (N₂ sealed) .

Specification

Item	Descriptions			
Measurement fluid	Various kinds of process gases for semiconductor			
Fitting shape	Type T integral structure (forged), Type S			
Connection	Integral structure compatible with 1/4 VCR®, 1/2 (3/8) VCR®, 1/4 UJR™			
Internal volume	Approx. 0.9 cm ³ (For Type S and 1/4UJR™, it depends on the fitting shape.)			
Pressure sensor seal method	Welding type			
Pressure range	Gauge Pressure	0 to 0.3, 0.5, 1, 2, 3.5, 5, 10, 20 MPa -0.1 to 0.3, 0.5, 1, 2, 3.5, 5, 10, 20 MPa		
Power supply voltage	Standard	10 to 30V DC		
	Increased safety "ec"	12 to 24V DC		
Load resistance	R max. (Ω) =50E-500 [E: Power supply voltage]			
Output	4 to 20mA DC			
Transmission system	2-wire system			
Accuracy	±0.25% F.S. (at 23°C) (Including linearity, hysteresis and repeatability)			
Temperature coefficient (ZERO, SPAN)	±0.02% F.S./°C			
Operating temperature	Standard	-20 to 70°C (No freezing or condensation)		
	Increased safety "ec"	Temperature class	T4	-20 to 70°C (No freezing or condensation)
			T5	
		T6	-20 to 30°C (No freezing or condensation)	
Storage temperature	-30 to 80°C (No freezing or condensation)			
Insulation resistance	100MΩ or over (joint to I/O terminal package: 50VDC)			
Electrical connections	M12 connector connection (4-pin)			
Case material	SUS305, PBT			
Protection class*	Standard	IP67 (IEC60529)		
	Increased safety "ec"	IP65 (IEC60529)		
Zero adjustment mechanism	External adjustment method (Side of case)			
Weight	Approx. 70 g (For Type S, it depends on the joint shape, excluding the cable.)			

*Mated state with M12 connector cable

Increased safety Pressure Sensor Type of protection "ec"

Features


- Acquired: the increased safety type construction of IECEx, ATEX, JAPAN, TS, KCs, and NEPSI. Ex ec IIC T4/T5/T6 Gc
- This pressure sensor can be used without the safety barrier in the places (Zone 2 / Category 3G).

Attention
Please make sure to use with the M12 connector cable specified by us.



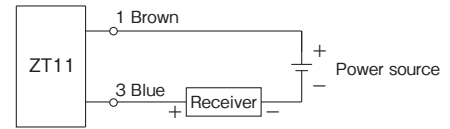
(Gauge pressure)

Electrical connection

Connector terminal array	Terminal number	2-wire system	Cable color
	1	Power source (+)	Brown
	2	—	White
	3	Power source (-)	Blue
	4	—	Black

Wiring

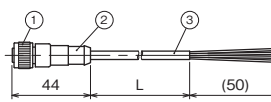
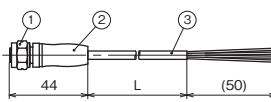
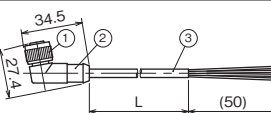
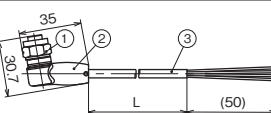
2-wire system



2-wire system Terminal array

- 1 - Brown: Power source (+)
- 3 - Blue: Power source (-)

M12 cable with connector (Optional)

	PUR cable (Oilproof)	PVC cable (Stainless nut)
Straight		
Type L		
Material	<ul style="list-style-type: none"> ① Zinc die casting (Nickel plating) ② TPU (Green) ③ PUR (Black) 	<ul style="list-style-type: none"> ① Stainless ② PP (White) ③ PVC (Gray)
Cable length (L)	3m or 5m	3m or 5m
Cross-section area of conductor	0.34mm ² (22AWG)	0.34mm ² (22AWG)
Core diameter including insulation	1.27mm	1.26mm
External cable diameter	4.2mm	4.7mm

* The protection structure of the cable with the M12 connector is protection class in a mating state.

Caution

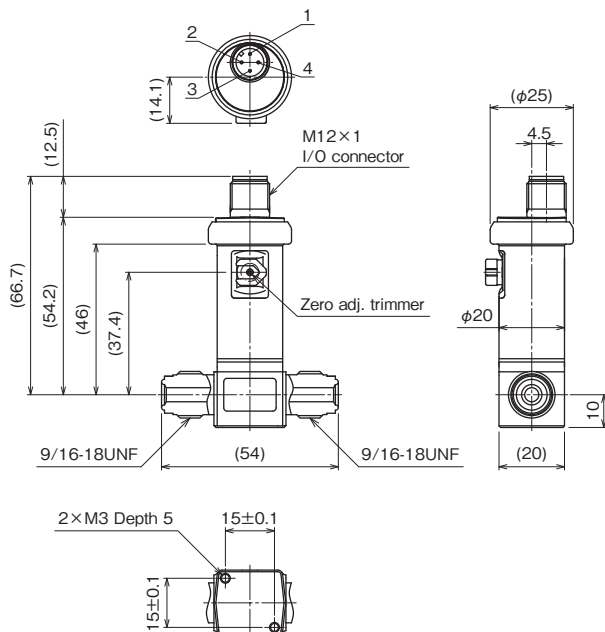
Please make sure to use the M12 connector cable shown in the left column when you specified "ec" increased safety type.

Dimensions 1

ZT11-1 (gauge pressure), ZT11-E, G (type "ec" gauge)

Unit: mm

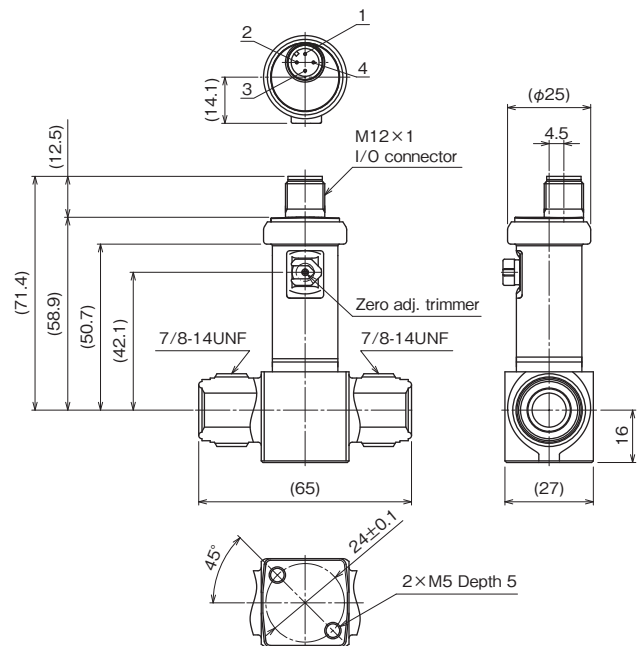
Type T



1/4 Compatible with VCR®

ZT11-13	<input type="checkbox"/>
ZT11-E3	<input type="checkbox"/>
ZT11-G3	<input type="checkbox"/>

Type T



1/2 (3/8) Compatible with VCR®

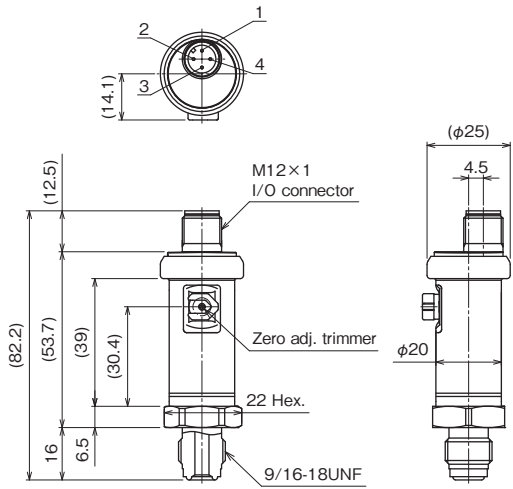
ZT11-14	<input type="checkbox"/>
ZT11-E4	<input type="checkbox"/>
ZT11-G4	<input type="checkbox"/>

Dimensions 2

ZT11-2 (gauge pressure),
ZT11-F, H (type "ec" gauge),

Unit: mm

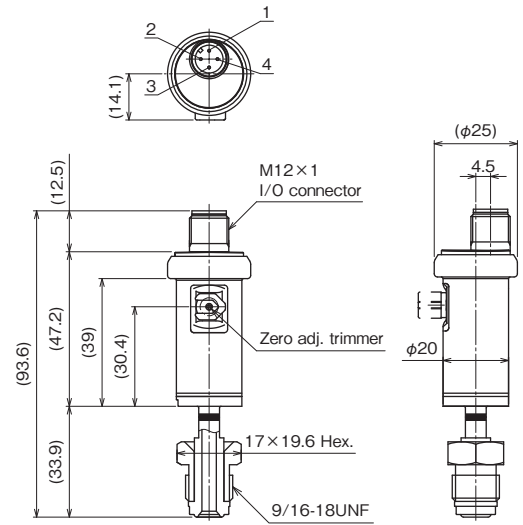
Type S



1/4 Compatible with VCR®

ZT11-23	<input type="checkbox"/>
ZT11-F3	<input type="checkbox"/>
ZT11-H3	<input type="checkbox"/>

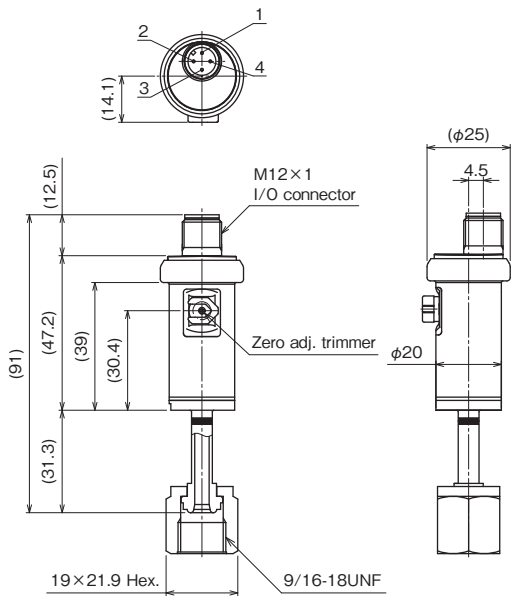
Type S



1/4 UJR™

ZT11-2N	<input type="checkbox"/>
ZT11-FN	<input type="checkbox"/>
ZT11-HN	<input type="checkbox"/>

Type S



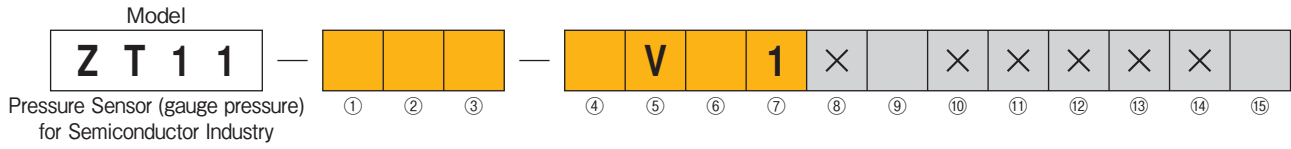
1/4 UJR™

ZT11-2Q	<input type="checkbox"/>
ZT11-FQ	<input type="checkbox"/>
ZT11-HQ	<input type="checkbox"/>

Gauge pressure range product

Model number configuration

Please specify the model number, each specs and the range for ordering.



Model number	Selective spec.	Additional spec. (Option)
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① Mounting (Attention)	1	Type T	Construction: IP67	
	2	Type S	Construction: IP67	
	E	Type T Increased safety "ec" for overseas	Construction: IP65	
	F	Type S Increased safety "ec" for overseas	Construction: IP65	
	G	Type T Increased safety "ec" for JAPAN	Construction: IP65	
	H	Type S Increased safety "ec" for JAPAN	Construction: IP65	

② Connection of fitting	3	1/4	Compatible with VCR [®] Male integrated	Type S	Type T
	4	1/2 (3/8)	Compatible with VCR [®] Male integrated	×	○
	N	1/4	UJR [™] Male nut	○	×
	Q	1/4	UJR [™] Female nut (Without pure ring)*1	○	×

③ Wetted parts by grade	C	UHP Grade · Pressure sensor : Hastelloy [®] C-22 equivalent (All welding) · Fitting : SUS316L			
	E	EP Grade · Pressure sensor: SUS316L (All welding) · Fitting: SUS316L			
	G	GP Grade · Pressure sensor: SUS316L (All welding) · Fitting: SUS316L			

④ Pressure range*2	C	-0.1 to 0.3MPa
	D	-0.1 to 0.5MPa
	E	-0.1 to 1MPa
	F	-0.1 to 2MPa
	G	-0.1 to 3.5MPa
	H	-0.1 to 5MPa
	J	-0.1 to 10MPa
	K	-0.1 to 20MPa
	1	0 to 0.3MPa
	2	0 to 0.5MPa
	3	0 to 1MPa
	4	0 to 2MPa
	5	0 to 3.5MPa
6	0 to 5MPa	
7	0 to 10MPa	
8	0 to 20MPa	

Please specify the pressure range and units separately besides selection of range code.

⑤ Accuracy	V	±0.25%F.S. (Temperature coefficient ±0.02%F.S./°C)
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⑥ Power source	M	10 to 30V DC (Standard)
	N	12 to 24V DC (Increased safety "ec")

⑦ Output	1	4 to 20mA DC (2-wire system)
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* 1 : EP · GP Grade : No pure ring
UHP Grade : With pure ring

* 2 : ③ C UHP Grade, please select from
0~0.5, 1, 2, 20MPa, -0.1~0.5, 1, 2, 20MPa.

Attention
Please make sure to use with the M12 connector cable specified by us.

⑨ M12 connector cable	0	Nil		Cable length 3m
	1	PUR cable (Oilproof)	Straight	
	2		L type	
	3	PVC cable (Stainless nut)	Straight	
	4		L type	
	5	PUR cable (Oilproof)	Straight	Cable length 5m
	6		L type	
	7	PVC cable (Stainless nut)	Straight	
8	L type			

⑮ Documents	0	Nil
	1	Required (Please specify the desired documents separately.) Submission drawings, instruction manual, inspection procedure, mill sheet, test report (1 pc 1 copy), inspection / traceability certificate, strength calculation, attended inspection

* Specify "X" if there is no applicable specification.

· VCR[®] is the registered trademark of SWAGELOK.
· UJR[™] is the trademark of Fujikin Incorporated.